UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,738	10/15/2003	Kyung-Soo Kim	SAM-0465	6148

7590 02/21/2006

Anthony P. Onello Jr.
MILLS & ONELLO LLP
Suite 605
Eleven Beacon Street
Boston, MA 02108

EXAMINER	
CHEN, KIN CHAN	
ART UNIT	**PAPER NUMBER**
1765	

DATE MAILED: 02/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/685,738	KIM ET AL.	
	Examiner	Art Unit	
	Kin-Chan Chen	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-19* is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 17, 2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 6, and 7 are rejected under 35 U.S.C. 102(a) as being anticipated by Chern et al. (US 2003/0102504).

In a method for forming multiple thickness gate dielectric layers, Chern (Figs 3c and 3d; [0021]-[0022]) teaches that a dielectric may be formed on a semiconductor

substrate. A portion of dielectric layer may be removed so as to expose a portion of the dielectric layer to form a gate dielectric layer including a thick portion of the dielectric layer and a thin portion formed of the exposed dielectric layer. The thin portion being of the first thickness and the thick portion being of a combined thickness of the first thickness and the second thickness. The dielectric materials may be oxide or nitride. The first dielectric layer may be formed of thermal oxide through rapid thermal oxidation. The etching may be dry or wet etching. Since the second dielectric is etched and the first layer remains, therefore the etch rate of the second dielectric layer is higher than that of the first dielectric.

4. Claims 1, 2, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al. (US 2002/0119615).

In a method for forming multiple thickness gate dielectric layers, Kim (Figs 13-15; [0057]-[0058]) teaches that a dielectric may be formed on a semiconductor substrate. A portion of dielectric layer may be removed so as to expose a portion of the dielectric layer to form a gate dielectric layer including a thick portion of the dielectric layer and a thin portion formed of the exposed dielectric layer. The thin portion being of the first thickness and the thick portion being of a combined thickness of the first thickness and the second thickness. The dielectric materials may be oxide or nitride.

The etching may be dry or wet etching. Since the second dielectric is etched and the first layer remains, therefore the etch rate of the second dielectric layer is higher than that of the first dielectric.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 5, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chern et al. (US 2003/0102504).

In a method for forming multiple thickness gate dielectric layers, Chern (Figs 3c and 3d; [0021]-[0022]) teaches that a dielectric may be formed on a semiconductor substrate. A portion of dielectric layer may be removed so as to expose a portion of the dielectric layer to form a gate dielectric layer including a thick portion of the dielectric layer and a thin portion formed of the exposed dielectric layer. The thin portion being of the first thickness and the thick portion being of a combined thickness of the first thickness and the second thickness. The dielectric materials may be oxide or nitride. The first dielectric layer may be formed of thermal oxide through rapid thermal oxidation. The etching may be dry or wet etching. Since the second dielectric is etched and the first layer remains, therefore the etch rate of the second dielectric layer is higher than that of the first dielectric.

Dependent claim 9 differs from Chern by repeating the process by using three dielectric layers. It would have been obvious to one with ordinary skilled in the art to use the combination of three dielectric layers because they have been used for the same purpose as gate dielectric, and repeat the foregoing process steps.

The above-cited claims differ from Chern by specifying well-known features (such as using hafnium oxide or aluminum oxide in claim 5; nitridizing the surface of dielectric layer in claim 8) to the art of semiconductor device fabrication. A person having ordinary skill in the art would have found it obvious to modify Chern by adding any of same well-known features to same in order to meet specific product design and requirement with a reasonable expectation of success. The examiner takes official notice of facts that applicant did not traverse the aforementioned conventionality (e.g., well-known features, common knowledge), which have been stated in the previous office action (May 10, 2005).

Response to Arguments

7. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

8. Claims 10-19 are allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 16, 2006

K-C Chen

Kin-Chan Chen
Primary Examiner
Art Unit 1765

K-C C